

### **REMARKS**

The Applicants sincerely appreciate the thorough examination of the present application as evidenced by the Office Actions of February 4, 2003, and August 6, 2003. In particular, the Applicants appreciate the Examiner's indication that the subject matter of Claims 11, 13, 24, 26, and 37-38 is allowable. The Applicants further submit that the subject matter of Claims 8, 12, 21, 34, and 39 is allowable as no art rejections have been applied to these claims. In addition, the Applicants appreciate the withdrawal of all prior rejections based on U.S. Patent No. 5,455,850, U.K. Publication No. GB 2 221 353, U.S. Patent No. 3,582,176, and the reference by Spence et al. entitled "Low Energy Point Reflection Electron Microscope."

In response, the Applicants have amended Independent Claims 3-5, 10-11, 13, 16-18, 23-24, 26, 29-31, 36-37, and 39 to address informalities noted in the Office Action; and the Applicants have amended Claim 21 to correct the punctuation thereof. As all claim amendments have been to overcome informalities in the claims, the Applicants respectfully submit that the scope of the claims remains unchanged.

The Applicants will show in the following remarks that all pending claims are patentable over the cited art. For at least the reasons discussed below, the Applicants respectfully submit that all claims are in condition for allowance, and a Notice of Allowance is, thus, respectfully requested in due course.

#### **All Rejections Under 35 U.S.C. Sec. 112 Have Been Overcome**

The Applicants have carefully reviewed and amended the claims in light of the informalities noted in Section 3 of the Final Office Action. Accordingly, all rejections relating to informalities under 35 U.S.C. Sec. 112 have been overcome. In addition, the Applicants respectfully submit that because all amendments have been made to address informalities under 35 U.S.C. Sec. 112, the scope of the claims has not been narrowed by the amendments.

The Applicants note that on page 3, the Office Action states that: claims "25 and 38 describe a second source of coherent radiation, which reflects only a portion of the light from

a reflector surface. (figure 11)." The Applicants respectfully submit that the recitations of Claims 25 and 38 meet all requirements of 35 U.S.C. Sec. 112, and that Claims 25 and 38 are supported in the application as originally filed, for example, by Figure 10 and portions of the specification related to Figure 10.

**Claims 8, 11-13, 21, 24-26, 34 and 37-39 Are Patentable As  
No Prior Art Rejections Have Been Applied To These Claims**

Claims 11, 13, 24, 26, and 37-38 are patentable because all rejections under 35 U.S.C. Sec. 112 have been overcome and because the Office Action has indicated that these claims are allowable over the prior art of record. In addition, Claims 8, 12, 21, 25, 34, and 39 are patentable because all rejections under 35 U.S.C. Sec. 112 have been overcome and because no art rejections have been applied to these claims. Accordingly, the Applicants respectfully request allowance of Claims 8, 11-13, 21, 24-26, 34, and 37-39.

**Claims 2-7, 9-10, 16-20, 22-23, 29-33, and 35-36  
Are Patentable Over The Combination Of Joy, Elliott, and Tetsuo**

Claims 2-7, 9-10, 16-20, 22-23, 29-33, and 35-36 have been rejected under 35 U.S.C. Sec. 103(a) as being unpatentable over Joy in view of Elliott "Integrated Circuit Manufacturing Technology" (hereinafter "Elliott") or Tetsuo et al. Japanese Publication No. 11-329944 (hereinafter "Tetsuo"). The Applicants respectfully submit that all claims are patentable over the combination of Joy, Elliott, and Tetsuo for at least the reasons discussed below.

Claim 5, for example, recites a method for patterning a layer on a substrate with a desired image. The method of Claim 5 includes:

- projecting coherent radiation toward a reflector surface so that the coherent radiation is reflected off the reflector surface wherein the reflector surface includes information that corresponds to the desired image;

- projecting a portion of the coherent radiation to the layer without reflecting off the reflector surface; and

- maintaining the substrate including the layer in the path of the of the reflected radiation and in the path of the portion of the coherent radiation projected without reflecting off the reflector surface so that the reflected radiation and the coherent

radiation projected without reflecting off the reflector surface interfere to provide a holographic projection of the desired image and so that the holographic projection of the desired image is projected onto the layer to thereby pattern the layer with the desired image;

wherein the step of projecting coherent radiation comprises projecting a coherent beam of electrons.

As discussed in the Applicants' Response of May 29, 2003, Joy discusses scanning electron microscope imaging as opposed to patterning as recited in Claim 5. Elliott and/or Tetsuo fail to provide the missing teachings. More particularly, Elliott discusses resists "formulated for use with e-beam exposure" (Elliott, page 77), and Tetsuo discusses a structure in Figure 3 including Si substrate 31, Si oxide film 32, polysilane 33, and chemistry amplification type positive resist 34, (Tetsuo, translation, page 3, paragraph 25) "to form a highly precise resist pattern, without a charge up arising" (Tetsuo, translation, page 3, paragraph 30).

Nothing in any of these references teaches or suggests patterning as recited in Claim 5 where a holographic projection of a desired image is projected onto a layer to thereby pattern the layer with the desired image. In contrast, Joy discusses scanning electron microscopy and Elliott and Tetsuo discuss electron beam resists without mention of holographic projection.

As discussed in Section 2142 of the Manual for Patent Examining Procedure, three basic criteria must be met to establish a *prima facie* case of obviousness. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second there must be a reasonable expectation of success. Finally, the prior art references when combined must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The Applicants respectfully submit that there is no suggestion or motivation in the references or in the knowledge generally available to one of ordinary skill in the art to somehow modify the scanning electron microscope of Joy to include a resist of either Elliott

and/or Tetsuo. More particularly, there is no suggestion or motivation to somehow use a resist of either Elliott and/or Tetsuo together with or in place of a backscattered electron detector of Joy. Moreover, if a resist of either Elliott and/or Tetsuo were used together with or in place of a backscattered electron detector of a scanning electron microscope of Joy, the Applicants respectfully submit that such a combination would have no expectation of success. Instead, the use of a resist in the scanning electron microscope of Joy would reasonably be expected to result in failure of the scanning electron microscope as opposed to somehow patterning a layer with a desired image.

For at least these reasons, the Applicants respectfully submit that Claim 5 is patentable over the combination of Joy, Elliott, and/or Tetsuo. The Applicants further submit that Independent Claims 2-4, 6-7, 9-10, 16-20, 22-23, 29-33, and 35-36 are patentable over the combination of Joy, Elliott, and/or Tetsuo for reasons similar to those discussed above with regard to Claim 5.

**Claims 3, 4, 16, 17, 29, 30 Are Independently  
Patentable Over The Combination Of Joy, Elliot, And Tetsuo**

Claims 3, 4, 16, 17, 29, and 30 are patentable over the combination of Joy, Elliot, and Tetsuo for the reasons discussed above. Claims 3, 4, 16, 17, 29, and 30 are also patentable for at least the additional reasons discussed below.

Claim 3, for example, recites that "the layer comprises an oxide layer that is activated on exposure to portions of the holographic projection of the desired image having sufficient intensity, so that the activated portions of the oxide layer can be selectively removed, maintained, or modified." Similar recitations are included in Claims 16 and 29. Claim 4, for example, recites that "the layer comprises a silicon layer that is activated on exposure to portions of the holographic projection of the desired image having sufficient intensity, so that activated portions of the silicon layer can be selectively oxidized or modified." Similar recitations are included in Claims 17 and 30.

The Applicants respectfully submit that the combination of Joy, Elliot, and Tetsuo fails to teach or suggest a silicon layer or a silicon oxide layer that is activated on exposure to

portions of a holographic projection having sufficient intensity so that activated portions can be selectively removed, maintained, modified, and/or oxidized. As discussed above, Joy relates to microscope imaging as opposed to patterning, and both Elliott and Tetsuo discuss patterning of electron beam resists. None of the cited references, however, discloses or suggests oxide or silicon layers that are activated on exposure to portions of a holographic projection.

Accordingly, the combination of Joy, Elliott, and Tetsuo fails to disclose or suggest the recitations of Claims 3 and 4, and Claims 3 and 4 are thus independently patentable. In addition, Claims 16, 17, 29, and 30 are also independently patentable for reasons similar to those discussed above with regard to Claims 3 and 4.

**Dependent Claims 8, 21, And 34 Are Independently Patentable Over The Combination Of Joy, Elliot, And Tetsuo**

Dependent Claims 8, 21, and 34 are patentable over the combination of Joy, Elliot, and Tetsuo for the reasons discussed above. Claims 8, 21, and 34 are also patentable for at least the additional reasons discussed below.

Dependent Claim 8, for example, recites that "projecting coherent radiation comprises projecting laser radiation," and Dependent Claims 12 and 34 include similar recitations. Joy discusses scanning electron microscopes, and Elliott and Tetsuo each discuss resists. None of the cited references, however, discloses or suggests projecting laser radiation. Accordingly, the Applicants respectfully submit that Claims 8, 21, and 34 are independently patentable over the cited art.

**Dependent Claims 12, 25, And 38 Are Independently Patentable Over The Combination Of Joy, Elliot, And Tetsuo**

Dependent Claims 12 and 25 are patentable over the combination of Joy, Elliot, and Tetsuo for the reasons discussed above. Dependent Claims 12 and 25 are also patentable for at least the additional reasons discussed below.

Dependent Claim 12, for example, recites "projecting two beams of coherent radiation toward a reflector surface", and Claim 25 includes similar recitations. The Applicants

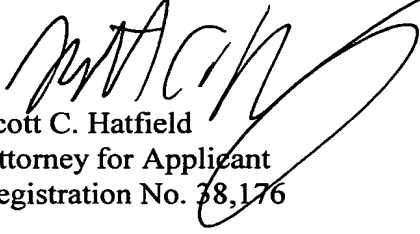
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respectfully submit that none of the cited references teaches or suggests projecting two beams of coherent radiation. Accordingly, the Applicants respectfully submit that Claims 12 and 25 are independently patentable over the cited art.

### **CONCLUSION**

The Applicants sincerely appreciate the Examiner's thorough examination of this application. In response, the Applicants submit that all rejections have been overcome and that all pending claims in the present application are in condition for allowance for at least the reasons discussed above. A Notice of Allowance is thus respectfully requested in due course. The Examiner is encouraged to contact the undersigned attorney by telephone should any additional issues need to be addressed.


Respectfully submitted,

  
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### **CERTIFICATE OF MAILING**

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop AF; Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on August 28, 2003.

  
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